

Serial No. 10/045,965
July 30, 2003
Reply to the Office Action dated July 10, 2003
Page 2 of 5

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (original): An acceleration sensor comprising:
a piezoelectric element which is formed by stacking an even number of piezoelectric layers greater than or equal to four layers;
support members for supporting both ends of the piezoelectric element in the longitudinal direction; and
electrodes which are provided in between the layers and on the front and back faces of the piezoelectric element,
wherein the interlayer electrodes include an electrode which is segmented into portions in the longitudinal direction near inflection points between an expansion stress and a contraction stress applied to the piezoelectric element in response to the application of an acceleration and lead electrodes led to the ends of the piezoelectric element in the longitudinal direction,
the two types of interlayer electrodes are alternately stacked with the piezoelectric layers therebetween,
the interlayer electrode in the middle of the piezoelectric element in the thickness direction is the segmented electrode,
the electrodes on the front and back faces of the piezoelectric element are led to the ends of the piezoelectric element in the longitudinal direction in order to extract generated charge, and
the piezoelectric layers are polarized in the thickness direction so that, when the acceleration is applied, charge having the same polarity is extracted from the lead electrodes led to the ends in the longitudinal direction in the piezoelectric layers on both sides of the lead electrodes and so that the center portion and both end portions of each piezoelectric layer are polarized in opposite directions.

Serial No. 10/045,965
July 30, 2003
Reply to the Office Action dated July 10, 2003
Page 3 of 5

Claim 2 (original): An acceleration sensor according to Claim 1, wherein the piezoelectric element is formed by stacking four piezoelectric layers, and

the piezoelectric layers are polarized in the thickness direction so that the piezoelectric layers on both sides of all the interlayer electrodes are polarized in opposite directions.

Claim 3 (original): An acceleration sensor comprising:
a piezoelectric element which is formed by stacking an odd number of piezoelectric layers greater than or equal to five layers;
support members for supporting both ends of the piezoelectric element in the longitudinal direction; and
electrodes which are formed in between the layers and on the front and back faces of the piezoelectric element,

wherein the interlayer electrodes include electrodes which are segmented into portions in the longitudinal direction near inflection points between an expansion stress and a contraction stress applied to the piezoelectric element in response to the application of an acceleration and lead electrodes led to the ends of the piezoelectric element in the longitudinal direction,

the interlayer electrodes which are arranged on both sides of the piezoelectric layer in the middle of the piezoelectric element in the thickness direction are the segmented electrodes,

the two types of interlayer electrodes are alternately stacked with the piezoelectric layers therebetween, excluding the piezoelectric layer in the middle in the thickness direction,

the electrodes on the front and back faces of the piezoelectric element are led to the ends of the piezoelectric element in the longitudinal direction in order to extract generated charge, and

Serial No. 10/045,965
July 30, 2003
Reply to the Office Action dated July 10, 2003
Page 4 of 5

among the piezoelectric layers, the piezoelectric layer in the middle in the thickness direction is not polarized, and the other piezoelectric layers are polarized in the thickness direction so that, when the acceleration is applied, charge having the same polarity is extracted from the lead electrodes led to the ends in the longitudinal direction in the piezoelectric layers on both sides of the lead electrodes and so that the center portion and both end portions of each piezoelectric layer are polarized in opposite directions.

Claim 4 (original): An acceleration sensor according to Claim 3, wherein the piezoelectric element is formed by stacking five piezoelectric layers, and the piezoelectric layers excluding the piezoelectric layer in the middle in the thickness direction are polarized in the thickness direction so tat the piezoelectric layers on both sides of the interlayer electrodes are polarized in opposite directions.

Claims 5-8 (canceled)